

**PEER REVIEW REPORT: DRAFT NEP WHITE SHARK STATUS REVIEW
(DR. KEVIN WENG COMMENTS)**

This final Peer Review Report summarizes the comments submitted by Dr. Kevin Weng on the draft NEP white shark status review prepared by the NMFS' Biological Review Team pursuant to two petitions to list the population as threatened or endangered under the Endangered Species Act (ESA). The draft status review report was sent to Dr. Weng on May 17, 2013. Dr. Weng is the Program Manager for the Pacific Fisheries Research Program in the School of Ocean and Earth Science and Technology at the University of Hawaii at Manoa.

A summary of Dr. Weng's comments are presented below and organized by sections of the draft status review report. More detailed track change comments on the draft report are available from NMFS' Southwest Region by making a request to Craig Wingert at craig.wingert@noaa.gov or 562-980-4021. The peer review comments were considered by the BRT and incorporated as appropriate in the final NEP white shark status review (Dewar et al., 2013). The final NEP white shark status review report was used by NMFS, together with other information, to make a 12-month finding on two petitions to list the NEP white shark population as threatened or endangered under the ESA. The 12-month finding was published in the Federal Register on July 3, 2013, indicating that a listing of the NEP white shark population was not warranted.

Executive Summary

No comments.

Introduction

- 1) The reviewer concurred that ocean acidification is one of many factors that should be evaluated in terms of risk to the NEP white shark population.

Background Information on White Sharks

- 1) The reviewer commented that if particular white sharks do not make a foraging shift to marine mammals and continue to forage at a lower trophic level and as suggested by radioisotope data, then those individuals are unlikely to be observed at pinniped colonies and other areas where they prey on pinnipeds.
- 2) In reference to the photo-ID studies conducted near the Farallon Islands and reported on by Anderson et al. (2011), the reviewer commented that dorsal fins that were used in the study can heal or change over time thus introducing errors into this methodology. The reviewer cited a paper by Marshall and Pierce (2012) in support of this comment.

DPS Determination

No Comments.

Assessment of NEP White Shark Population Extinction Risk

- 1) The reviewer suggested that the correction factor developed by the BRT to convert logbook reported white shark catch data in various fisheries to a total estimated catch by fishery may need to be adjusted to take into account the ratio of total fishing trips to the number of observed fishing trips.
- 2) The reviewer suggested that catch data and other information could be used to estimate minimum adult white shark population sizes and that other age classes could be estimated and summed with adults for a total minimum population estimate. He provided a rough estimate of how that could be estimated for 1985.
- 3) The reviewer noted that long-lived iteroparous species such as white sharks are insulated from the risks of demographic stochasticity.
- 4) The reviewer commented that U.S. based set net fisheries provide a high quality CPUE record when there is collaboration between researchers and fishermen and that there are benefits to maintaining these fisheries in order to monitor the NEP white shark population.
- 5) The reviewer suggested that the 3-4 fold increase over the past 5 years in beach-cast sea otter carcasses where white shark bites were the primary cause of death was too fast to be the result of a population increase and instead might be the result of changes in foraging behavior.
- 6) The reviewer concurred with the BRT that use of an open population model for mark recapture estimation was more appropriate than a closed model such as that used by Chapple et al. (2011). He provided rationale for why an open population model was more appropriate.
- 7) The reviewer commented that photo-ID methodologies such as those used by researcher in central California and at Guadalupe Island underestimate white shark abundance and demographics (e.g. sex ratios, proportion of life stages, etc.). He cited a study by Delaney et al. (2012) in support of this criticism.
- 8) The reviewer agreed with the BRT's conclusion that the white sharks observed at the two aggregation sites represent only a subset of the total NEP white shark population. He further identified two areas of uncertainty: (a) equability of sampling with regard to sex and age, and (b) how many other subsets of the total population occur with the range of the NEP population. He indicated that white sharks occur along the coast from Alaska to Mexico throughout the year suggesting that not all individuals migrate to the SOFA and cited several papers in support of this position.
- 9) The reviewer indicated an important part of the BRT's review should be to estimate the total abundance of the white shark population in the NEP and delineate the proportion that occurs at the aggregation sites.